

# ON POISONING BY MEDICINAL DOSES OF BROMIDE OF POTASSIUM.

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To asylum physicians opportunities frequently occur for testing the effects of various drugs in the treatment of disease, and their constant intercourse with their patients enables them to recognize idiosyncrasies to the influence of powerful remedies. It cannot be denied that those influences that conduce to the production of insanity likewise produce a susceptibility of the system to certain drugs, and it is a well-known fact that, in the case of sedatives, medicines are administered with much more freedom in asylums than they are in general practice.

Some years ago, while acting as Medical Officer in the City of London Asylum, I interested myself in this subject, and my studies were awakened by noting the effects of bromide of potassium in the treatment of epilepsy, in which disease—the idiopathic type—this drug stands unrivalled.

Dr. Clouston,\* the greatest living authority on the treatment of epilepsy by the regular and systematic administration of bromide of potassium, states that any physician out of an asylum who has an epileptic to treat, and sends him into an asylum without trying the effects of the bromides, does not give his patient the best chance known to science, and in many of our asylums it is regularly and systematically given to the epileptic patients in doses varying from 20 to 30 grains three times daily.

Having become accustomed to its use, and being fully persuaded of its beneficial effects in suitable cases while I was Medical Officer at the Carlisle Asylum, I did not

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\* "Lectures on Mental Diseases," 1st Ed., page 410.

hesitate to commence this treatment when I undertook similar duties at the City of London Asylum. Previous to this no treatment for epilepsy had been in use, and the male epileptics were the most troublesome of our patients, requiring seclusion frequently, and the presence of a discoloured eye or cut face could nearly always be traced to some quarrelsome epileptic. After a time, and under the regular administration of bromide of potassium, the number of fits appreciably diminished, and that irritable, impulsive condition—so frequent a sequence to the epileptic seizure—became almost unknown among our male epileptic patients. The effect of the bromide upon the female epileptics was not so marked as it was in the case of the men; they were either reduced to a condition of “bromism” or else they were most violent and aggressive. The bromide in these cases seems to have the effect of benumbing the nervous system for the time only, and the nerve-energy, which has been bottled up, as it were, by the sedative, bursts through with increased vigour, so that these explosions proved most detrimental to the usual peace and quietude of the wards.

At the time of the occurrence of the following cases of poisoning our patients had been under this regular and continuous treatment for 18 months, with occasional brief intermissions, so that they should have been quite “acclimatized” to the drug. Towards the end of this period I had the unique experience of having to treat several cases exhibiting the typical symptoms of poisoning by this drug. Whether the poisoning was due to the potassium or the bromine it is difficult to say, authorities differing on this subject, but the symptoms were so well defined in my cases, and are so excellently described in Wood’s *Therapeutics*,\* that I offer no apology for quoting his remarks on the subject of poisoning by bromide of potassium. “The cerebral symptoms are: a sense of mental weakness, heaviness of intellect, failure of memory, partial aphasia, great somnolence and depression of spirits. With these may be decided impairment of the sensibility of the mucous membranes and of the skin, so that titillation of the fauces may be without effect, and, according to Puche, even heat applied to the skin calls forth no complaint. Huette has seen in some cases

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\* “A Treatise on Therapeutics,” by Dr. H. C. Wood; page 323.



absolute anæsthesia of the conjunctiva . . . . there is also very generally foetid breath, and an eruption which may indeed be very severe."

In the cases which were under my treatment—six in number, and all males—these symptoms were more or less defined, according to the duration of the administration of the drug, and probably other unascertained causes. Two of these cases ended fatally, and I think a few notes of the symptoms presented by them may prove of interest to our readers.

CASE I.—Edward R. was admitted to the City of London Asylum in 1868, suffering from idiopathic epilepsy. On admission he was depressed, had suicidal tendencies, and there was a marked hereditary tendency to insanity. He was then in good bodily health, but gradually the fits became more frequent and severe, and this was followed by a general deterioration in his physical condition, but without any recognisable organic change. During the winter of 1886-87 the fits were noted to have become of more frequent occurrence and of increasing severity, so that he was constantly falling down, and frequently injuring himself thereby. As this seemed an excellent case to try the effects of the bromide on, he was treated with 25 grains of this drug thrice daily, the treatment beginning early in February of 1887. About three weeks afterwards he was noted as looking ill; he suddenly became stupid, dull, and so feeble as to necessitate his removal to bed. His tongue was dry, and sordes rapidly collected on his teeth. The temperature continued normal—at times even subnormal—throughout his illness. The pulse was small, rapid and compressible. The thoracic organs, on examination, presented no unusual symptoms. In the course of a few days the symptoms became more aggravated, and stimulants seemed to have little effect in arousing the torpid vital forces. On March 6th it is noted that there was an entire relaxation of all the muscles both voluntary and involuntary. The patient lay in a drowsy semi-comatose condition, disinclined for any movements, became irritable when disturbed, seemed unable to articulate distinctly, his speech being thick and sluggish, as if from impaired innervation of the speech muscles. He had a frequent cough, but from impaired reflex power he was unable to expel the mucus, which readily accumulated in the throat. Dysphagia was so marked that food frequently passed into the larynx, giving rise to severe paroxysms of coughing, and his breath had an intensely disagreeable odour. The various reflexes were dulled; there was general superficial anæsthesia of both cutaneous and mucous surfaces, and touching the conjunctiva elicited no response, while pricking the skin of his body seemed unfelt. The heart's action was very feeble, and the sounds indistinct, but no organic changes were noted. Pulmonary congestion set in; the patient became more and more exhausted; gradually the drowsy condition passed into coma, and he died about five days after the onset of the symptoms.

At the autopsy the following changes were observed:—The cerebral sinuses were full of fluid blood of a bright red—almost arterial colour. The cerebral membranes were intensely congested, and the brain was softer than normal. The cortex was of a pink tint, and there were localised patches of softening occupying the anterior portions of both

optic thalami. The lungs were deeply congested, and the left organ was of a purplish mottled colour on section; both lungs were, however, crepitant. The heart was flaccid in a condition of diastole, all its chambers were empty, and the myocardium was very friable and contained much blood. The other organs presented nothing worthy of note.

I am of opinion we have here presented to us a typical case of bromide of potassium poisoning, and from the short time the patient was under the influence of the drug before the onset of his fatal illness, and the comparative smallness of the doses administered, an explanation of the symptoms is to be found either in a peculiar idiosyncrasy of the patient to the drug, or else some deleterious adulteration of the drug existed. Another explanation has been advanced, and that is that the drug may have been accumulative in this case, and that some failure of the urinary system in eliminating the poison produced the symptoms. Be this as it may, there were no symptoms indicative of kidney disease noted, nor did the urine present any extraordinary character.

CASE II.—The other fatal case was that of Alfred O. who was admitted to the City of London Asylum in 1880, and in whom, like the previous case, the epilepsy was accompanied by great depression and suicidal tendencies. He took frequent and severe fits, in one of which he once fell, breaking his collar-bone. In February of 1887 he was put on 25 gr. doses of bromide of potassium thrice daily, and about the middle of the following month he was noted to be stupid, drowsy, and lethargic. He was at once sent to bed, stimulants freely administered, the bromide stopped, and a mixture of which each dose contained tinct. nuc. vomic., m. xv, was given him every four hours. On the 17th March he is noted to have been still in a drowsy condition, his speech thick and indistinct, and there seemed to be an entire relaxation of the whole muscular system. He was disinclined for any movement; there was a troublesome cough, but he was unable to expectorate the sputum; there was marked difficulty in swallowing, the administration of nourishment being frequently followed by spasmodic attacks of coughing. The temperature on this date was 97·6°, and the pulse 110, feeble and compressible. The various reflexes were dulled, and cutaneous sensibility over the whole body much impaired. About this time evidences of left pulmonary congestion made their appearance, but on the following day he looked better, he was not so drowsy, and speech and the power of swallowing had both improved. On the 19th he was again looking very ill, and was only partially conscious. He had passed very little urine, which was of a high colour, high specific gravity, deposited urates, and had a peculiar odour. His face was now livid, owing to interference in the pulmonary circulation; the temperature rose to 99·4°, and the pulse 120 and very feeble. The drowsy, lethargic condition passed rapidly into coma, he could only be aroused with great difficulty, and the dysphagia was so severe that much of his food trickled into the larynx, giving rise to paroxysms of



coughing. He became so feeble that the power of expectoration was much diminished, and it soon became evident the pulmonary congestion was extending. The hands were tremulous, and he kept picking at his bedclothes in a nervous manner. His breath had a peculiar disagreeable odour, so penetrating as to be felt at once on entering his ward, and his urine, which all along had been scanty and high coloured, exhaled a similar smell. The coma deepened, and death took place five days after the onset of his illness.

At the post-mortem examination the central sinuses were found to contain a little fluid blood of a bright red colour, and the cerebral membranes and brain were congested. The lungs were likewise congested, and the left organ presented a mottled or marbled appearance on section. There was a large amount of extramural fat over the heart, which otherwise, however, appeared healthy; its chambers were empty, and the left ventricle was firmly contracted. The kidneys were both in an advanced stage of cirrhosis, the contour of the organs irregular, and the capsules firmly adherent.

In this case the fatal termination may be accounted for by the non-elimination of the poison by the urinary system, owing to the pathological condition of the kidneys; but in the previous case and in several of my other cases no renal disease existed, and, therefore, this causal factor must be excluded in searching for an explanation of the symptoms. We are therefore compelled to fall back upon our two original theories: viz., (*a*) a peculiar idiosyncrasy of those patients affected to the influence of the drug; or (*b*) some adulteration in the bromide itself, rendering its action poisonous. In the cases of the other patients they were affected in a similar manner, but the symptoms were not so severe nor were they so prolonged, lasting only about 24 to 48 hours, and recovery was rapid under stimulants. One patient, a strong, healthy young man, was so ill that, for some days after the acute symptoms had disappeared, his life was almost despaired of.

Some of my critics may consider me bold in recording cases like the above without offering some explanation of the means employed to discover the cause of the "epidemic," for it is a curious fact that all the cases appeared within the short period of a few weeks, and I have had no similar cases since.

I thought at first that the bromide must be adulterated, and I had a sample forwarded to the County Analyst, who, however, reported that the salt submitted to him was a good specimen of bromide of potassium, that it responded to all the chemical tests of that salt, and that he was unable to detect the presence of any impurity or adulteration in it.

My next enquiry was directed to the dose administered to my patients. I was accustomed to dispense the medicine in xii oz. bottles, and the question arose whether the attendant occasionally, having forgotten to give the medicine at the proper time, did not give his patients a double dose when the next period arrived. To prevent any possibility of this occurring, after the first case appeared, I dispensed the medicine in iii oz. bottles, the contents to last only one day, and I was careful to see for myself that the patients had their medicine at the proper time—after meals.

Nevertheless, after all these precautions, several fresh cases appeared, and I have been forced to the conclusion that such cases of poisoning as I have described can only be explained by the theory that in certain persons some idiosyncrasy exists to the influence of the drug. Of course, I exclude from this category those cases of kidney disease where, in all probability, the poisonous symptoms are due on the one hand to an accumulation within the system of the drug, and on the other to a failure in the eliminating apparatus in eliminating the poison from the system.

The existence of a disease at the time of the administration of a medicine may influence or modify its action on the system, and we cannot yet say how far the existence of the epilepsy combined with the mental symptoms of insanity may have acted in converting what is really a medicine into a poison.

In conclusion, the record of such cases, even if they savour a little of the confessional, should make us at all times guarded in prescribing for our patients, and these cases of “unintentional poisoning” should teach us to study the idiosyncrasies of our patients before undertaking a prolonged course of treatment by such drugs as may prove injurious.

